Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

CHARACTERS AND DISTRIBUTION OF THE GENERA OF BRACHIOPODA.

BY CHARLES W. ROLFE.

(*Based mainly on external characteristics.*)

I. Valves not united by a hinge, but kept in position by muscular action (*a*).
  - (*a*) Shell structure horny (*b*).
    - (*b*) Valves nearly equal, shell hatchet-shaped, or quadrate (*bb*).
      - (*bb*) Beaks equal, projecting, pointed, without a groove between them for the passage of the foot, *Lingula* Brg.
        - Subgenera:
        - Forms with the beaks unequal, *Lingulepis* Hall.
        - Forms with groove, *Lingulella* Salter.
    - (*b*) Valves unequal, shell rounded or oval, dorsal valve the larger (*c*).
      - (*c*) Dorsal valve limpet-shaped, smooth or concentrically striated, ventral valve slightly convex, with a rounded or oval opening behind the beak, which does not reach the margin, *Discina* Lmck.
        - Subgenera:
        - Forms in which the opening for the foot lies at the posterior end of the furrow, *Orbiculoidea* d'Orb.
        - Forms in which the ventral valve is flat or concave, and the foramen is narrow and slit-like, *Discinisca* Dall.
    - (*b*) Valves unequal, ventral valve the larger (*cc*).
      - (*cc*) Surface smooth, form somewhat triangular, ventral valve high-conical, with a flattened area running

from beak to margin, in the center of which a shallow furrow is impressed, *Acrotreta* Kut.

(*cc*) Surface rough, ventral valve depressed-conical, its beak with a rounded foramen, and a flattened area beneath. Dorsal valve with a curved beak arising from two marginal projections, *Acrothela* Linn.

(*a*) Shell structure horny, or more or less calcareous (*d*).

(*d*) Shell very small (usually 19 mm. or less) (*dd*).

(*dd*) Form long-oval, surface shining, larger valve convex, with a long-pointed beak, smaller valve flat, *Schmidtia* Volb.

(*dd*) Form oval, both valves convex, larger with a short beak, *Leptobolus* Hall.

(*d*) Shell moderate in size, with rounded outlines (*e*).

(*e*) Ventral valve with a marginal sinus, reaching nearly to the beak (*ee*).

(*ee*) Marginal sinus relatively narrow, surface calcareous, with petal-like markings, beak anterior, *Trematis*, Sharpe.

(*ee*) Marginal sinus broad, triangular or semicircular, beak posterior, *Schizocrania*, H. & W.

(*e*) False hinge line straight, nearly or quite equaling the breadth of the shell. *Kutorgina* Bill.

(*e*) False hinge line, when present, short. Shell nearly circular, depressed, smooth, thickened toward the hinge, Valves unequal, the larger with a shallow groove beneath the beak. The central muscle scars converge posteriorly, *Obolus* Eichwald.

(*e*) Resembling Obolus. The central

muscle scars diverge posteriorly, *Obolella* Billings.

(*a*) Shell structure calcareous (*f*).

(*f*) Dorsal valve limpet-shaped, ribbed, ventral less convex (*ff*).

(*ff*) Ventral valve usually adhering to some foreign object. Inner border of both valves rough, *Crania* Ret.

Subgenus.

Free forms, with inner border smooth, *Pseudocrania* McCoy.

(*f*) Both valves convex, the larger with a heavy back, large area, and pseudodeltidium (*g*).

(*g*) Shell circular, or transversely oval, area broader than long (*gg*).

(*gg*) Beak of larger valve high and heavy, that of the smaller somewhat truncated, *Monomerella* Bill.

(*gg*) Beak of larger valve low and heavy, that of the smaller somewhat pointed, *Dinobolus* Hall.

(*g*) Shell somewhat elongated, area longer than broad, beak of larger valve high and heavy, that of the smaller truncated, *Trimerella* Bill.

II. Valves united by a true hinge, shell structure always calcareous, (*h*).

(*h*) Hinge line curved (*hh*).

(*hh*) Beak pierced by a foramen, (*i*).[1]

(*i*) Surface smooth or concentrically striated (*ii*).

(*ii*) Beak closely incurved, surface impunctate. Interior with spires, *Athyris* McCoy.

(*ii*) Beak not closely incurved, *i.e.*, a space between it and the smaller valve. Surface punctate. No spires (*j*).

(*j*) Posterior portion with two

---

[1] Many young shells have this character, while in adult forms of the same species it is absent.

folds separated by a sinus, on the smaller valve, and a single fold on the larger, or the folds in both valves are replaced by a truncation of the posterior margin. Arm supports reaching not more than one-third the length of the shell, *Terebratula* Llwd.

(*j*) Arm supports long (*jj*).

(*jj*) Both valves convex. Foramen large. Arm-supports united by a loop near the hinge, *Cryptonella* Hall.

(*jj*) Smaller valve usually almost flat, rarely convex. Arm-supports united by two loops which unite posteriorly to form a short, free median plate, *Centronella* Bill.

Subgenera:

Forms with surface ribbed or striated, *Leptocœlia* Hall.

(*ii*) Beak very short. Shell large. Both valves convex, depressed, without fold and sinus, *Meganteris* d'Arch.

(*i*) Surface ribbed or striated (*k*).

(*k*) See Leptocœlia above.

(*k*) Shell punctate, much elongated, without fold and sinus, or spires, *Rensselaeria* Hall.

(*k*) Shell punctate. Interior with spires (*kk*).

(*kk*) Beak closely incurved, no area (*l*).

(*l*) Form more or less elongated. Central ribs narrow. Cardinal plate broad, *Rhynchospira* Hall.

(*l*) Form transverse. Under the beak of the larger valve a triangular opening, which is filled by the incurved beak of the smaller, *Trematospira* Hall.

(*k*) Shell impunctate (*m*).

(*m*) Apex of spires directed towards ventral valve (*mm*).

(*mm*) Shell concavo-convex, *Cœlospira* Hall.

(*mm*) Shell plano-convex, *Zygospira* Hall.

(*m*) Apex of spires directed towards dorsal valve. Shell plano- or biconvex. Surface with ribs and transverse lines of growth, *Atrypa* Dalm.

(*m*) No spires (*n*).

(*n*) Shell plano- or slightly biconvex. Ventral valve with a broad, deep sinus on its posterior margin, which reaches half-way to the beak. Dorsal with a marginal sinus, *Eatonia* Hall.

(*n*) Shell tranversely oval. Surface with cellular impressions arranged in rows, *Eichwaldia* Bill.

(*hh*) Beak not pierced by a foramen, (*o*).

(*o*) Shell punctate (*oo*),

(*oo*) Shell spherical. Surface smooth or covered with hair-like spines. Beak light, sharp-pointed, with an area beneath, *Nucleospira* Hall.

(*oo*) Surface ribbed. Beak heavy, no area, *Amphigenia* Hall.

(*o*) Shell impunctate (*p*).

(*p*) Beak thin and sharp (*pp*).

(*pp*) Valves nearly equal. Shell transverse, smooth or faintly ribbed. Small valve with a sinus, large valve with a fold, *Camerella* Bill.

(*pp*) Shell usually more or less triangular, rarely globose or transversely oval. Beak sharp, directed forward, or sharply incurved. Larger valve with a sinus, smaller with a fold, *Rhynchonella* Fisch.

(*pp*) Like Rhynchonella, but the inside of the ventral shell has converging tooth plates, which unite to form a low median septum, and the dorsal valve has a low, trough-like process, and high median septum, *Camarophoria* King.

(*p*) Beak large and heavy (*q*).

(*q*) Surface smooth, or concentrically striated, rarely with indistinct ribs. Form varying from ovoid to transverse. No area. Interior with spires. Ventral valve with two curiously curved plates, called " shoe-lifter processes," *Merista* Guess.

(*q*) Differs from Merista only in the absence of the shoe-lifter processes, *Meristella* Hall.

(*q*) Differs from Meristella in that the two processes which form the loop connecting the spires do not diverge again after uniting, *Meristina* Hall.

(*q*) Form varying from elongate to gibbous or rotund. Surface ribbed, rarely smooth. Ventral valve very much the larger. Beak very large and prominent. No area. No fold or sinus, *Pentamerus* Sow.

Subgenera.

Forms which have a narrow area in the ventral valve, and a fold and sinus, *Pentamerella* Hall.

Exceedingly short and gibbous forms, having an area in both valves, *Gypidula* Hall.

Forms which have the ventral valve smaller, and less convex, than the dorsal, *Anastrophia* Hall.

See also Amphigenia above, and Spiririferina below.

(*h*) Hinge line straight (*r*).

(*r*) Shell concavo-convex (*rr*).

(*rr*) Surface spinose, especially along the hinge (*s*).

(*s*) Large valve very convex, or abruptly bent " knee form." Beak large, abruptly incurved. Smaller valve more or less concave. Area linear or absent. Hinge toothless, *Productus* Sow.

Subgenera.

Forms with a low area on both valves, and hinge teeth, *Productella* Hall.

Forms with a high area on the ventral valve. Hinge toothless, *Aulosteges* Helm.

(*s*) Shell broadly transverse. Beak not prominent. Low area on both valves. Spines along hinge, *Chonetes* Fischer.

(*rr*) Surface not spinose (*ss*).

(*ss*) Shell semicircular or transverse. Beak not prominent. Area of the larger valve low, with a triangular opening beneath the beak. No deltidium. Area of smaller valve linear or absent, *Tropidoleptus* Hall.

(*ss*) Shell semicircular, often a little longer than broad, flat, sometimes abruptly near the posterior third, widest at hinge. Both valves with an area, that of the ventral slightly larger, with a small triangular area closed by a deltidium. Beak not prominent. Hinge plain, *Strophomena* Blainv.

Subgenera.

Forms with crenulated hinge, *Strophodonta* Hall.

Small, more convex forms, varying from transverse to nearly semicircular, *Leptæna* Dalm.

(*ss*) Shell varying in form and convexity between Strophomena and Orthis. Ventral valve with a relatively high area, pseudodeltidium, and prominent, often recurved beak. Dorsal valve with a linear area, *Streptorhynchus* King.

Subgenus.

Biconvex forms, with an exceedingly high area, and coarse rounded ribs, separated by angular depressions, *Meekella* W. & St. J.

(*r*) Shell biconvex (*t*). (The convexity of the smaller valve sometimes slight).

(*t*) See Streptorhynchus and Meekella above.

(*t*) Shell depressed, nearly flat, radially folded. Valves nearly equal, the larger with an area, and strongly hooked beak, which is closely incurved. No spires, *Stricklandia* Bill.

(*t*) Form quadrate, varying from semicircular. No internal spires (*tt*).

(*tt*) Convexity of the smaller valve

sometimes slight. Both valves with an area and foramen. No deltidium. Area not striated. Hinge line usually less than breath of shell. Sinus and fold usually absent, rarely prominent, *Orthis* Dalm.

Subgenera.

Shell two-lobed through the presence of a sinus in each valve, *Bilobites* Lin.

Very convex forms, with hinge line often exceeding the breadth of the shell, and a prominent sinus and fold, *Platystrophia* King.

(*tt*) Shell with a wide area, foramen, and pseudodeltidium in each valve, *Orthisina* d'Orb.

(*tt*) Larger valve pyramidal. Otherwise Orthis-like, *Skenidium* Hall.

(*t*) Shell nearly spherical, punctate thin hinge line very short. Area small. Beak recurved, *Syntrielasma* M. & W.

(*t*) Shell triangular, varying towards circular. Sinus and fold usually prominent. Hinge line often exceeding the breadth of the shell. Beak usually more prominent than in Orthis. Area in both valves, that in the ventral larger, and striated with horizontal and vertical lines. Spires present, *Spirifer* Sow.

Subgenera.

Forms with punctate shell (*v*).

(*v*) Surface finely spinose. Foramen covered by a deltidium. Hinge line sometimes curved, *Spiriferina* d'Orb.

(*v*) Hinge line long and straight. Larger valve with a broad area, a narrow triangular fissure partly closed by a deltidium, and a broad median sinus. Smaller valve without area, *Syringothyris* Winch.

(*v*) Punctate shells which closely resemble Cyrtia, *Cyrtina* Dav.

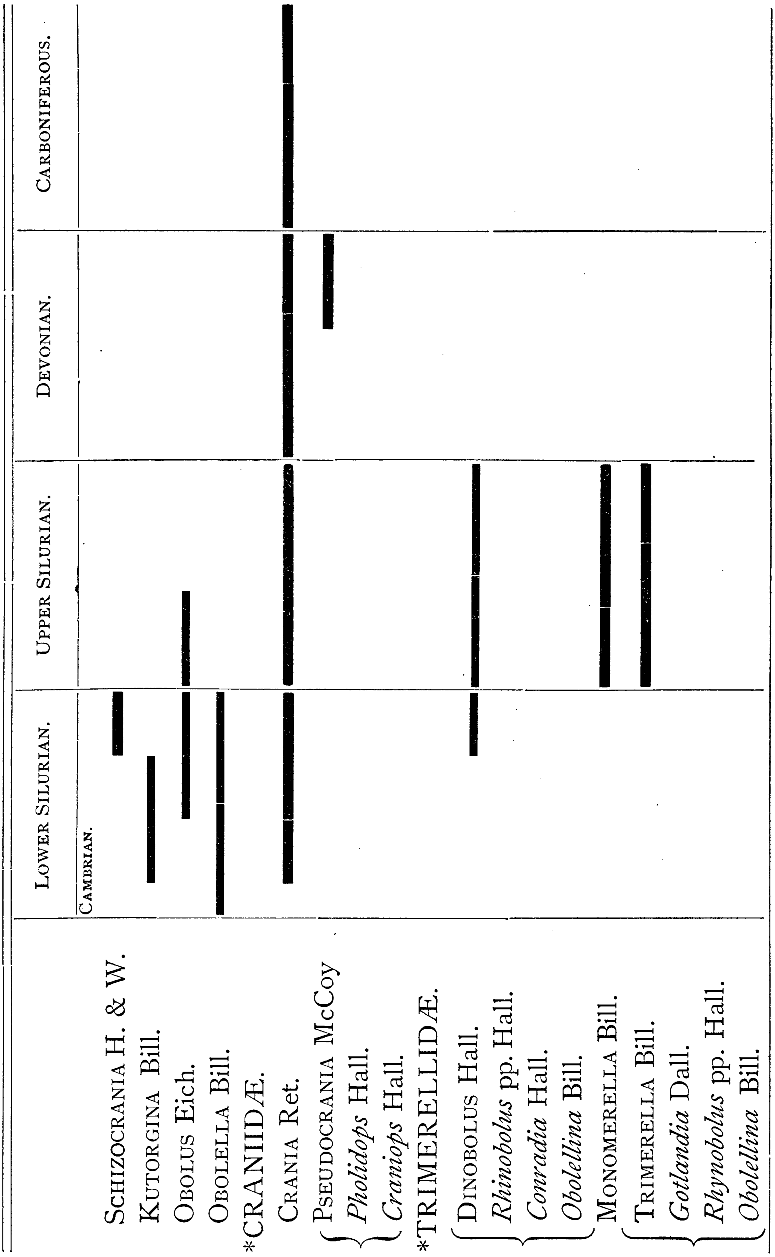
Forms with impunctate shell (*vv*).

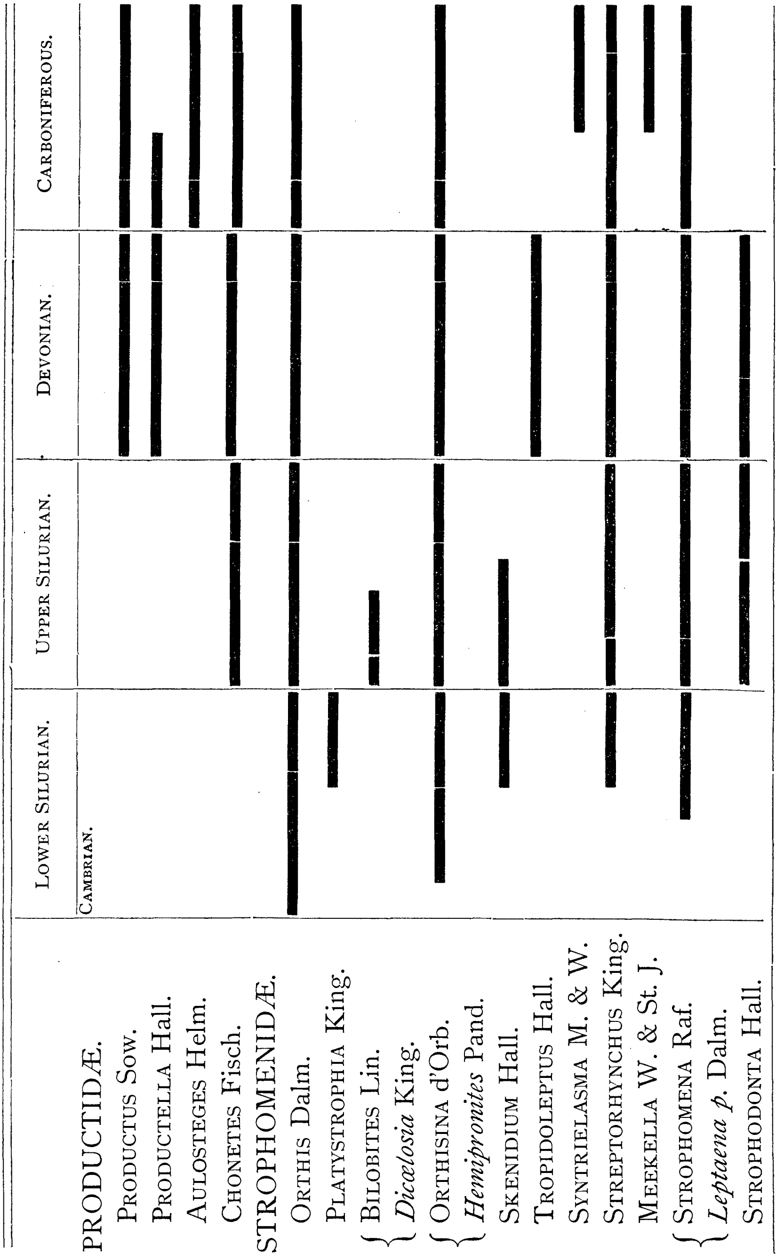
(*vv*) Shell gibbous. Surface smooth or finely striated. Ventral valve very convex, with a prominent incurved beak. Dorsal flat, or much less convex, *Martinia* McCoy.

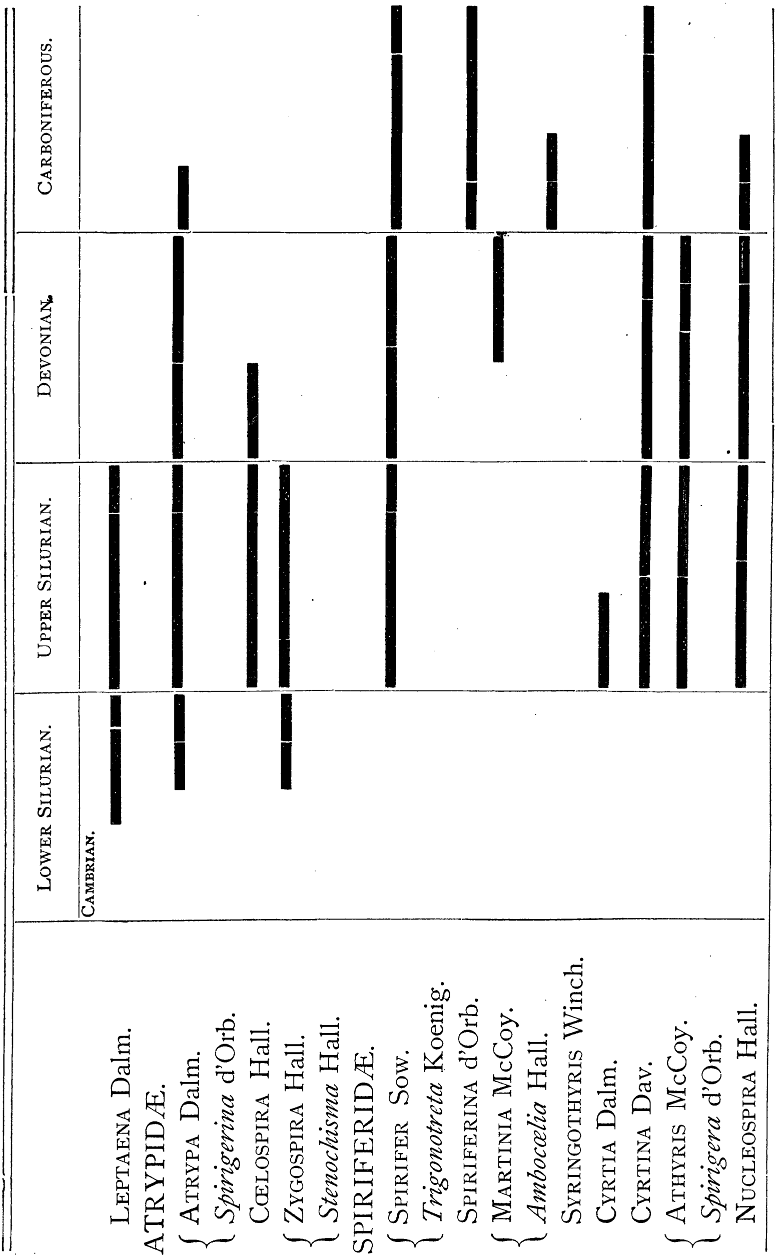
(*vv*) Surface ribbed. Larger valve high pyramidal, with a large, flat, triangular area, and a median fissure closed by a pseudodeltidium. Smaller valve convex, *Cyrtia* Dalm.

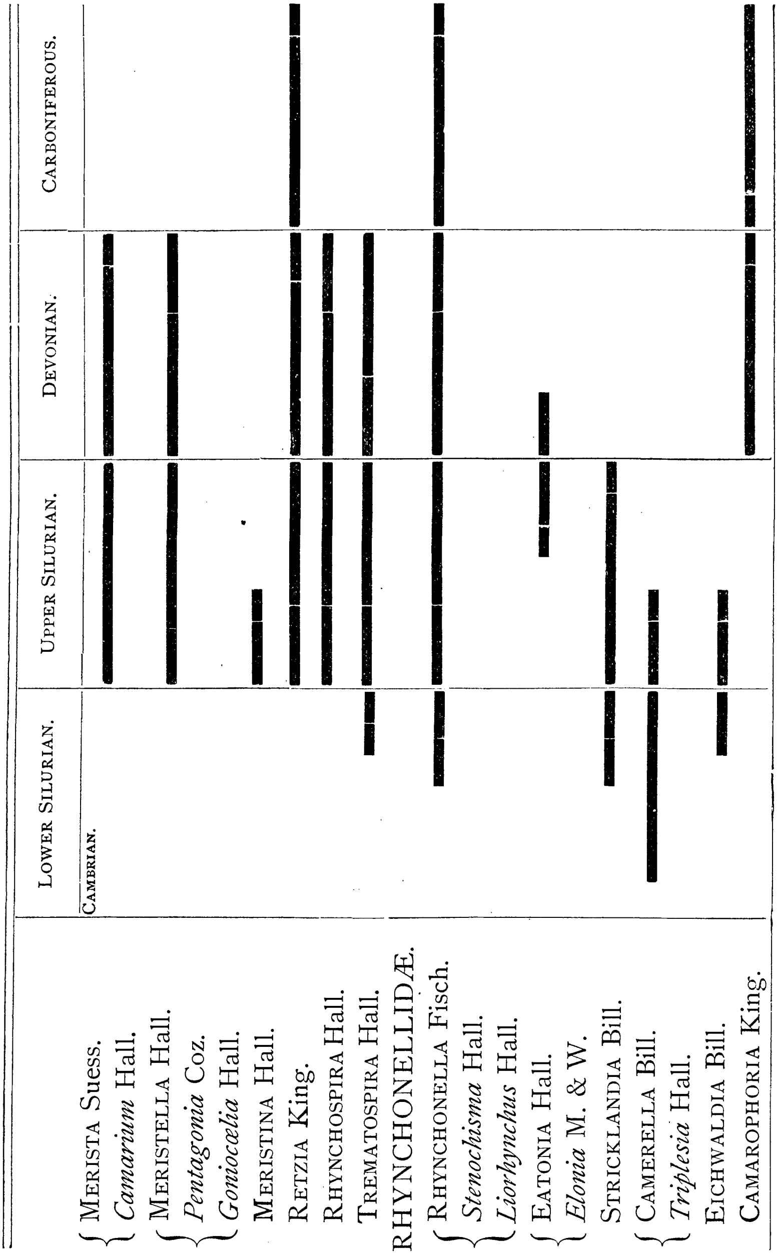
SYNONYMY AND DISTRIBUTION.

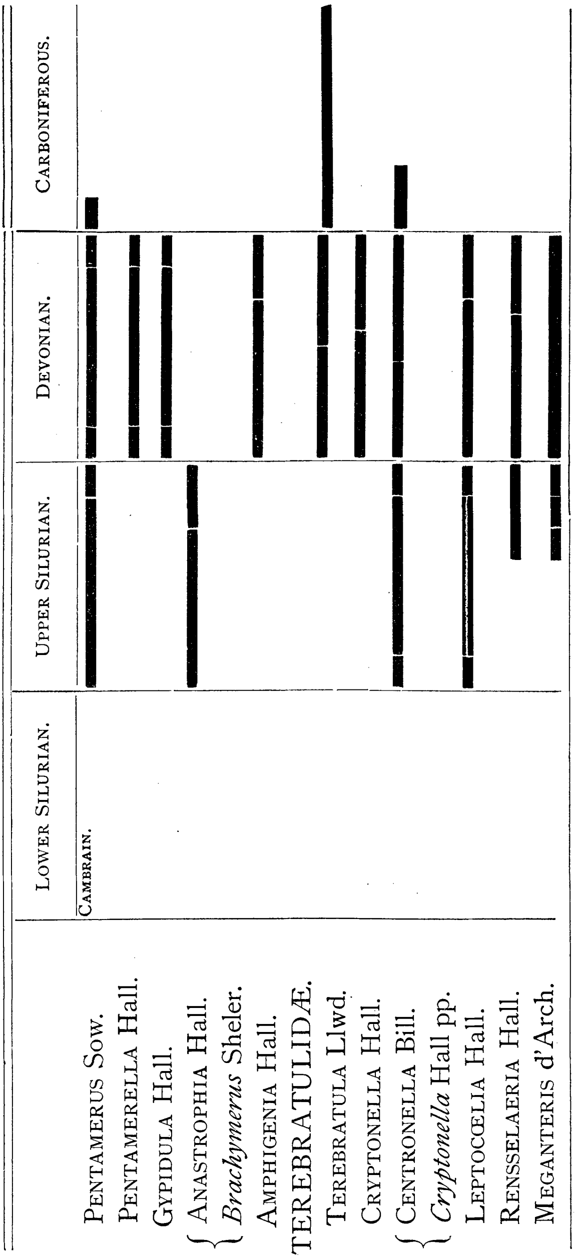
	LOWER SILURIAN.		UPPER SILURIAN.	DEVONIAN.	CARBONIFEROUS.
	CAMBRIAN.				
LINGULIDÆ.					
LINGULA Brg.	▬	▬	▬	▬	▬
LINGULELLA Saller.	▬	▬			
LINGULEPIS Hall.	▬	▬			
*DISCINIDÆ.					
{ DISCINA Linck.	▬	▬	▬	▬	▬
{ *Orbiculoidea* Owen.					
DISCINISCA Dall.		▬	▬	▬	▬
{ *Schizotreta* Kut.					
{ *Orbiculoidea* d'Orb.		▬	▬	▬	▬
*OBOLIDÆ.					
ACROTRETA Kut.	▬	▬			
ACROTHELE Linn.	▬				
{ SCHMIDTIA Vol.			▬	▬	
{ *Ungula* Pand.					
{ *Dicellomus* Hall.					
LEPTOBOLUS Hall.		▬			
{ TREMATIS, Sharpe.	▬	▬			
{ *Orbicella* d'Orb.					


LOWER SILURIAN.
CAMBRIAN.
UPPER SILURIAN.
DEVONIAN.
CARBONIFEROUS.
SCHIZOCRANIA H. & W.
KUTORGINA Bill.
OBOLUS Eich.
OBOLELLA Bill.
*CRANIIDÆ.
CRANIA Ret.
PSEUDOCRANIA McCoy
Pholidops Hall.
Craniops Hall.
*TRIMERELLIDÆ.
DINOBOLUS Hall.
Rhinobolus pp. Hall.
Conradia Hall.
Obolellina Bill.
MONOMERELLA Bill.
TRIMERELLA Bill.
Gotlandia Dall.
Rhynobolus pp. Hall.
Obolellina Bill.


CAMBRIAN.
LOWER SILURIAN.
UPPER SILURIAN.
DEVONIAN.
CARBONIFEROUS.
PRODUCTIDÆ.
PRODUCTUS Sow.
PRODUCTELLA Hall.
AULOSTEGES Helm.
CHONETES Fisch.
STROPHOMENIDÆ.
ORTHIS Dalm.
PLATYSTROPHIA King.
BILOBITES Lin.
Dicœlosia King.
ORTHISINA d'Orb.
Hemipronites Pand.
SKENIDIUM Hall.
TROPIDOLEPTUS Hall.
SYNTRIELASMA M. & W.
STREPTORHYNCHUS King.
MEEKELLA W. & St. J.
STROPHOMENA Raf.
Leptaena p. Dalm.
STROPHODONTA Hall.


Cambrian.
Lower Silurian.
Upper Silurian.
Devonian.
Carboniferous.
Leptaena Dalm.
ATRYPIDÆ.
Atrypa Dalm.
Spirigerina d'Orb.
Cœlospira Hall.
Zygospira Hall.
Stenochisma Hall.
SPIRIFERIDÆ.
Spirifer Sow.
Trigonotreta Koenig.
Spiriferina d'Orb.
Martinia McCoy.
Ambocœlia Hall.
Syringothyris Winch.
Cyrtia Dalm.
Cyrtina Dav.
Athyris McCoy.
Spirigera d'Orb.
Nucleospira Hall.


CARBONIFEROUS.
DEVONIAN.
UPPER SILURIAN.
LOWER SILURIAN.
CAMBRIAN.
MERISTA Suess.
Camarium Hall.
MERISTELLA Hall.
Pentagonia Coz.
Goniocœlia Hall.
MERISTINA Hall.
RETZIA King.
RHYNCHOSPIRA Hall.
TREMATOSPIRA Hall.
RHYNCHONELLIDÆ.
RHYNCHONELLA Fisch.
Stenochisma Hall.
Liorhynchus Hall.
EATONIA Hall.
Elonia M. & W.
STRICKLANDIA Bill.
CAMERELLA Bill.
Triplesia Hall.
EICHWALDIA Bill.
CAMAROPHORIA King.


CARBONIFEROUS.
DEVONIAN.
UPPER SILURIAN.
LOWER SILURIAN.
CAMBRAIN.
PENTAMERUS Sow.
PENTAMERELLA Hall.
GYPIDULA Hall.
ANASTROPHIA Hall.
Brachymerus Sheler.
AMPHIGENIA Hall.
TEREBRATULIDÆ.
TEREBRATULA Llwd.
CRYPTONELLA Hall.
CENTRONELLA Bill.
Cryptonella Hall pp.
LEPTOCŒLIA Hall.
RENSSELAERIA Hall.
MEGANTERIS d'Arch.